

CITY OF HAMILTON

PUBLIC HEALTH SERVICES Health Protection Division

TO: Mayor and Members Board of Health	WARD(S) AFFECTED: CITY WIDE
COMMITTEE DATE: January 24, 2011	
SUBJECT/REPORT NO: Legionella: Cooling Tower Registry By-law (City Wide) (BOH09021(b))	
SUBMITTED BY: Elizabeth Richardson, MD, MHSc, FRCPC Medical Officer of Health Public Health Services Department	PREPARED BY: Eric Mathews 905-546-2424 Ext. 2186
SIGNATURE:	

RECOMMENDATION

- (a) That BOH Report BOH09021(b) be received;
- (b) That the draft Hamilton Cooling Tower Registry By-law, attached as Appendix "A" to Report BOH09021(b) which has been prepared in a form satisfactory to the City Solicitor, be passed;
- (c) That outstanding business item C directing staff to consult with stakeholders regarding the Cooling Tower Registry By-law and report back to the Board of Health be recorded as complete and be removed from the Outstanding Business List.

EXECUTIVE SUMMARY

Public Health Services (PHS) has consulted with stakeholders and the public and is now reporting back to the Board of Health with a final Cooling Tower Registry By-law. The background and rationale for this By-law is described in BOH Report BOH09021 and BOH09021(a), and summarized here.

A By-law will improve the scope and accuracy of the PHS cooling tower inventory, expedite Legionella outbreak investigations, and diminish the potential of Legionella illnesses that could be related to exposure to cooling tower emissions. The By-law will require all owners of cooling towers to register their equipment with PHS; have a risk management plan; and maintain a log book of repairs and maintenance. The By-law will require annual renewal of registration information and notification of PHS within 10 days of a change in registration information.

A Public Health Inspector will perform an on-site compliance audit once every four years and take action where deemed necessary. This audit will involve verification of the accuracy and completeness of registration information, the existence of a risk management plan, and the maintenance of a log book of repairs and maintenance activities.

The Cooling Tower Registry By-law meets the expectations of the Ontario Public Health Standards (OPHS) under the Investigation, Identification, and Management of Health Hazards Protocol. Funding for the implementation and enforcement of this By-law will be the same as other required public health standards and programs. PHS will implement and enforce this By-law with existing resources and budget.

Should the Cooling Tower Registry By-law be passed by Council, PHS will soon thereafter communicate the passing of this By-law to known cooling tower owners, operators, and local cooling tower maintenance companies. PHS will also advertise the passing of this By-law in local newspapers. PHS will begin enforcing registration on May 31, 2011.

FINANCIAL / STAFFING / LEGAL IMPLICATIONS (for Recommendation(s) only)

Financial:

None. The Cooling Tower Registry By-law meets the expectations of the Ontario Public Health Standards (OPHS) under the Investigation, Identification, and Management of Health Hazards Protocol. Funding for the implementation and enforcement of this Bylaw will be the same as other required public health standards and programs. PHS will implement and enforce this Bylaw with existing resources and budget.

Staffing:

None. The Cooling Tower Registry By-law meets the expectations of the Ontario Public Health Standards (OPHS) under the Investigation, Identification, and Management of Health Hazards Protocol. Funding for the implementation and enforcement of this By-law will be the same as other required public health standards and programs. PHS will implement and enforce this By-law with existing resources and budget.

Legal:

The Cooling Tower Registry By-law is authorized by the *Municipal Act, 2001* as set out in its recitals.

HISTORICAL BACKGROUND (Chronology of events)

In 2006 and 2008, clusters of Legionella infections were identified in the City of Hamilton involving 11 and 10 cases respectively. PHS conducted an investigation to determine possible sources of exposure and concluded that a common source could not be found. Although there is limited evidence available, the increase in cases of Legionella infections may have been caused by dissemination of Legionella bacteria located in a reservoir associated with cooling towers and evaporative condenser units. These units are known to be reservoirs for Legionella bacteria and are known to create conditions favourable for the growth, discharge, and transmission of Legionella bacteria.

As part of the PHS Legionella outbreak investigation in 2006, sampling and testing of cooling towers was conducted. Water samples from 39 cooling towers were tested; 13 (33.3%) cooling towers were found to contain Legionella or Legionella-like bacteria and 3 (7.7%) cooling towers were found to contain *Legionella pneumophila* serogroup 1, the most common cause of human illness. However, due to a lack of clinical specimens and laboratory evidence it was not possible to establish a genetic match between the Legionella bacteria found in the cooling tower and the Legionella bacteria that caused illness in some Hamilton residents.

During and following the 2006 outbreak, PHS commenced an inventory of all cooling towers within the City of Hamilton. Staff identified 216 cooling towers on 154 properties. On two occasions PHS wrote Orders under the *Health Protection and Promotion Act* for owners/operators to provide locations of their cooling towers.

PHS found that this inventory was crucial in the efficiency and timely response of the outbreak investigation conducted in 2008. However, it is very likely that changes have occurred regarding ownership, operation, and maintenance since 2006. PHS is of the opinion that a responsible local approach would be to continue with the annual communication of best practices for Legionella control to cooling tower owners/operators and to improve the cooling tower inventory and maps by means of implementing a By-law that requires cooling tower owners to register their cooling towers with PHS.

A cooling tower registry By-law will collect data for: risk communication purposes for relevant audiences and outbreak investigations in accordance with *Infectious Diseases Protocol, 2008* (or as current).

In June 2009, Board of Health Report BOH09021 directed PHS to consult with stakeholders and report back with a draft cooling tower and evaporative condenser Registry By-law. This was completed and PHS reported back to the BOH with Report BOH09021(a) which directed PHS to;

- Finalize a Cooling Tower Registry By-law in consultation with stakeholders and the public and report back to the Board of Health for its consideration.
- That staff consider a prescribed risk management template to be included in the proposed By-law, and
- That the By-law, once enacted, be reviewed for its efficacy every 36 months.

POLICY IMPLICATIONS

No policy implications have been identified.

RELEVANT CONSULTATION

During the drafting and finalization process PHS has consulted with the following – see Appendix D for details:

- Industry stakeholders including Cooling Tower Owners/operators and Water Treatment Service providers – See Appendix D for summary and analysis of stakeholder consultations.
- Local Chambers of Commerce – No comments received back
- Ontario Ministry of the Environment – Carl Slater - no conflict or interference with Ministry of Environment approvals or other processes
- Ontario Ministry of Labour – Kim Ahrens – no comment
- Ontario Ministry of Health and Long-Term Care – Anthony Amalfa – no comment
- McMaster Institute of Environment and Health – Marie McKeary – prepared Appendix D - analysis of stakeholder consultation; provided input into By-law development; Risk Management Plan Template development; Registration Form development.
- City of Hamilton, Legal Services Division – Lisa Pasternak –prepared the By-law and provided supportive advice and edits to this report, the Risk Management Plan Template, and the Registration Form.
- City of Hamilton, Community Services Department, Recreation Division – Chris Herstek – no Policy implications indicated.
- City of Hamilton, Public Works Department, Corporate Facilities Section – Rom D'Angelo - no Policy implications indicated.

ANALYSIS / RATIONALE FOR RECOMMENDATION

(include Performance Measurement/Benchmarking Data, if applicable)

In November 2009, May 2010, and October 2010 PHS mailed consultation packages to stakeholders (cooling tower owners/operators, water treatment companies (and various ministries). These packages included a letter of explanation, a copy of the draft By-law and an evaluation tool, draft registration forms, and a draft risk management plan template. Information was posted on the PHS website and a notice was placed in the At Your Service page of the Hamilton Spectator and in all Brabant Newspapers in November 2009.

The McMaster Institute of Environment and Health prepared stakeholder consultation questionnaires and surveys, compiled the responses, and provided a summary report of the stakeholder and public consultation (Appendix D).

Appendix A is the Cooling Tower Registry By-law prepared by PHS in consultation with stakeholders and subsequent to advertising in local news papers in November 2009. The main objective of this By-law is to create an accurate and comprehensive inventory of cooling towers for PHS investigation of any future outbreaks of Legionellosis. Another objective is to diminish the potential of future outbreaks by requiring that all cooling towers have a risk management plan and that all owners/operators maintain an up-to-date log book for each cooling tower. The most effective method for PHS to ensure that these objectives are met is to require all owners/operators to register their equipment annually.

Appendix B is the risk management plan template that cooling tower owners and operators can use to ensure they have a risk management plan that will comply with the By-law. Staff were directed to consider including a prescribed risk management template in the proposed By-law. Staff have developed a risk management plan template for owners/operators to use, but are recommending that it not be part of the By-law. This will permit flexibility to update the template when existing American Society of Heating Refrigeration and Air conditioning Engineers (ASHRAE) or Cooling Technology Institute (CTI) Guidelines change or become Standards. Presently both ASHRAE and CTI are in the process of changing their Legionella control guidelines. If the risk management plan were part of the By-law it would be necessary to bring all future changes to the BOH and to Council for approval. The risk management plan template will be a dynamic document due to changing guidelines and as new research and experiences arise. The risk management plan template will provide Cooling Tower owners or operators with guideline to prepare a risk management plan that meet the requirements of the By-law.

Appendix C is the Cooling Tower Registration Form. All cooling tower owners/operators will be required to complete a Cooling Tower Registration Form annually. This form will

collect information regarding the cooling tower owner, operator, service company, and the location of the cooling tower. Further, this form collects details of each specific cooling tower, such as; year constructed, method of biocide injection, shut-down periods, presence of drift eliminators, volume of water, and if a risk management plan is in place. If any information changes on the Cooling Tower Registration Form the owner is required to submit an update to PHS within 10 business days of the change. PHS is planning to have a web-based registration process.

Appendix D is a summary of the consultation process that was used to develop the By-law, Registration Forms, and the Risk Management Plan template.

After the Cooling Tower Registration By-law comes into force PHS will audit 25% of the cooling towers annually. These locations will be randomly selected with the intent of auditing each cooling tower within the City of Hamilton once every four years. During each audit a Public Health Inspector will ensure that all registration information is accurate and up to date, that an adequate Risk Management Plan is in place, and that a repairs and maintenance log book is kept up-to-date. Registrations will be assessed annually to ensure compliance.

Enforcement of the By-law will occur when cooling tower information has not been updated, when a cooling tower is not registered, or when a risk management plan or log books are not in place or maintained. PHS will not inspect or test cooling towers on a routine basis or as part of this proposed By-law. The risk management plan assesses the critical risks that are associated with Legionella bacteria colonization. Risk management plans that address the critical risks should not have an issue with Legionella emissions. Literature also indicates that the presence of a risk management plan and chemical disinfection processes are negatively associated with Legionella colonization. There is insufficient evidence to recommend sampling as a risk reduction method.

ALTERNATIVES FOR CONSIDERATION

(include Financial, Staffing, Legal and Policy Implications and pros and cons for each alternative)

1. Create a By-law that prescribes operational standards for cooling towers and evaporative condensers, supported by an inspection and testing program.

Pros: The City of Hamilton would have an extensive surveillance program pertaining to cooling towers and would potentially reduce the risk of exposure to Legionella bacteria related to cooling tower emissions.

Cons: An operational standards and inspection program would not fall within the mandate of the Board of Health or PHS. 100% of the funding would need

to be acquired through local taxes or registration fees from cooling tower owners/operators. The funding for this type of program would be significant for laboratory costs and a considerable amount of time would be needed to inspect and assess the operation and maintenance of a cooling tower.

Existing industry best practices and Guidelines are expected to become industry Standards, which would require the By-law to be changed.

There is uncertainty regarding the effectiveness of cooling tower inspection programs from a cost – benefit perspective.

2. Not implement a Cooling Tower Registry By-law.

Pros: A minimal opportunity could exist to divert public health resources to other public health priorities.

Cons: This would not provide an up-to-date and accurate inventory of cooling towers within the City of Hamilton. Additional information useful in investigating local clusters or outbreaks of Legionellosis and for the purpose of communicating with cooling tower owners and operators would not be available to PHS. This would not diminish the risk of cooling tower emissions that could contain Legionella bacteria.

CORPORATE STRATEGIC PLAN (Linkage to Desired End Results)
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Focus Areas: 1. Skilled, Innovative and Respectful Organization, 2. Financial Sustainability, 3. Intergovernmental Relationships, 4. Growing Our Economy, 5. Social Development, 6. Environmental Stewardship, 7. Healthy Community

1. Skilled, Innovative and Respectful Organization

- ♦ The passing of a Cooling Tower Registry By-law is an innovative and leading step in Ontario and likely Canada. Other public health jurisdictions and agencies that have experienced Legionella infection outbreaks may wish to consult with the City of Hamilton should they also pursue controlling the risks of Legionella bacteria emissions from Cooling Towers.

2. Inter-governmental Relations

- ♦ The Cooling Tower Registry By-law may influence provincial policy development regarding the standardization or regulation of Cooling Tower operations and maintenance.

- ♦ Other public health agencies may seek guidance or advice from the City of Hamilton.

4. Environmental Stewardship

- ♦ The Cooling Tower Registry By-law should reduce the impact of Hamilton's industrial, commercial Private and Public operations on the environment.

5. Healthy Community

- ♦ The Cooling Tower Registry By-law should diminish the risks of environmental emissions of Legionella bacteria from Cooling Towers and risks to the community.

APPENDICES / SCHEDULES

Appendix "A" to Report BOH09021(b)
Appendix "B" to Report BOH09021(b)
Appendix "C" to Report BOH09021(b)
Appendix "D" to Report BOH09021(b)

Authority:

Item , Committee

Report (Staff report number)

CM: Date

Bill No.

CITY OF HAMILTON

BY-LAW NO. _____

Respecting the Registration of Cooling Towers.

WHEREAS Council desires to establish a Cooling Tower Registry to facilitate communication with owners with respect to controlling the growth of Legionella bacteria and to improve Public Health Services monitoring of possible sources of exposure to Legionella bacteria;

AND WHEREAS sections 8, 9 and 10 of the *Municipal Act, 2001*, S.O. 2001, c. 25, authorize the City of Hamilton to pass by-laws necessary or desirable for municipal purposes, and in particular paragraphs 5 through 8 of subsection 10(2) authorize by-laws respecting the economic, social and environmental well-being of the municipality; the health, safety and well-being of persons; the provision of any service or thing that it considers necessary or desirable for the public; and the protection of persons and property;

AND WHEREAS section 425 of the *Municipal Act, 2001*, S.O. 2001, c. 25, authorizes the City of Hamilton to pass by-laws providing that a person who contravenes a by-law of the City of Hamilton passed under that Act is guilty of an offence;

AND WHEREAS the *Municipal Act, 2001*, S.O. 2001, c. 25, further authorizes the City of Hamilton, amongst other things, to delegate its authority, to impose fees or charges on persons for services or activities provided or done by or on behalf of it, to provide for inspections and inspection orders, and to make orders to discontinue activity or to do work;

NOW THEREFORE the Council of the City of Hamilton enacts as follows:

Definitions

1. In this By-law:

“business day” means any day on which the City of Hamilton’s administration buildings are open for business;

“City” means the geographical area of the City of Hamilton or the municipal corporation as the context requires;

“Cooling Tower” means a device for the lowering the temperature of:

- (a) recirculated water by bringing the water into contact with fan-forced or fan-induced atmospheric air; or
- (b) water, a refrigerant or other fluid in a pipe or other container by bringing recirculated water and fan-forced or fan-induced atmospheric air into contact with the pipe or other container;

which may or may not share a common reservoir with one or more other Cooling Towers;

“Log Book” means a book, including but not limited to, an electronic database or document, kept in a form satisfactory to the Medical Officer of Health, recording the date and details of all maintenance, including but not limited to any breakdowns and repairs, carried out on the Cooling Tower and all other actions related to the Risk Management Plan or otherwise to the control of Legionella bacteria;

“Medical Officer of Health” means the City’s Medical Officer of Health or his or her designate;

“Officer” means a Public Health Inspector or other person appointed or employed by the City of Hamilton for the enforcement of this By-law and includes the Medical Officer of Health;

“operator” means the owner or the person in control of a Cooling Tower;

“person” includes but is not limited to an individual, sole proprietorship, partnership, association or corporation; and

“Risk Management Plan” means a plan:

- (a) prepared in accordance with standards, guidelines or other similar documents with respect to controlling the growth Legionella bacteria in Cooling Towers published by the American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE), the Cooling Technology Institute (CTI) or another such organization or by the Cooling Tower manufacturer;
- (b) describing equipment installed and processes implemented to control the growth of Legionella bacteria; and
- (c) including all of the information required by the Cooling Tower Risk Management Plan Template provided by the Medical Officer of Health.

Scope

- 2. This By-law applies to all Cooling Towers.

Registration

- 3. Every owner of a Cooling Tower operating or capable of operating on [the date this By-law is passed] shall register the Cooling Tower with the Medical Officer of Health within 30 days of [the date this By-law is passed].
- 4. Every owner of a Cooling Tower that commences to operate or to be capable of operating after [the date this By-law is passed] shall register the Cooling Tower with the Medical Officer of Health within 30 days of the date the Cooling Tower commences to be in operation or to be capable of operating.
- 5. Every registration expires on May 1 of each year if it is not renewed before that date.
- 6. To register or renew a registration, the owner of a Cooling Tower shall complete and submit to the Medical Officer of Health an application approved by the Medical Officer of Health containing such information as the Medical Officer of Health may require together with the registration fee, if any.
- 7. Every owner shall notify the Medical Officer of Health of any change in circumstances in connection with information given to the Medical Officer of Health under section 6 within 10 business days after the change occurs.

General Prohibitions

8. No person shall operate a Cooling Tower unless the Cooling Tower is registered under this By-law.
9. Every operator shall ensure that there is a Risk Management Plan in respect of each Cooling Tower they operate.
10. Every operator shall ensure that an up-to-date and legible Log Book is kept in respect of each Cooling Tower they operate.
11. No person shall enter inaccurate information in a Log Book or falsify, mutilate or deface a Log Book.

Administration and Enforcement

12. The Medical Officer of Health is authorized to administer and enforce this By-law including but not limited to prescribing the format and content of any forms or other documents required under this By-law, including but not limited to the Cooling Tower Risk Management Plan Template.
13. Registration and other fees under this By-law shall be as set and approved by Council from time to time under the User Fees and Charges By-law.
14. An Officer may enter on land at any reasonable time for the purpose of carrying out an inspection to determine whether or not the following are being complied with:
 - (a) this By-law;
 - (b) a direction or order made under this By-law; or
 - (c) an order made under s. 431 of the *Municipal Act, 2001*.
15. An Officer may, for the purposes of the inspection under Section 14:
 - (a) require the production for inspection of documents or things relevant to the inspection;

- (b) inspect and remove documents or things relevant to the inspection for the purpose of making copies or extracts;
 - (c) require information in writing or otherwise as required by the Officer from any person concerning a matter related to the inspection; or
 - (d) alone or in conjunction with a person possessing special or expert knowledge, make examinations or take tests, samples or photographs necessary for the purposes of the inspection.
16. The City may require the operator of a Cooling Tower to pay any costs incurred by the City in exercising its authority to inspect under section 15, including but not limited to the cost of any examination, test, sample or photograph necessary for the purposes of the inspection.
17. An Officer may undertake an inspection pursuant to an order issued by a provincial judge or justice of the peace under Section 438 of the *Municipal Act, 2001* where he or she has been prevented or is likely to be prevented from carrying out an inspection under Sections 14 and 15.
18. If an Officer is satisfied that a contravention of this By-law has occurred, he or she may make an order requiring the person who contravened the By-law or who caused or permitted the contravention or the owner or occupier of the property on which the contravention occurred to discontinue the contravening activity.
19. An order under Section 18 shall set out:
- (a) reasonable particulars of the contravention adequate to identify the contravention and the location of the property on which the contravention occurred; and
 - (b) the date or dates by which there must be compliance with the order.
20. If an Officer is satisfied that a contravention of this By-law has occurred, he or she may make an order requiring the person who contravened the By-law or who caused or permitted the contravention or the owner or occupier of the property on which the contravention occurred to do work to correct the contravention.

21. An order under Section 20 shall set out:
- (a) reasonable particulars of the contravention adequate to identify the contravention and the location of property on which the contravention occurred;
 - (b) the work to be completed; and
 - (c) the date or dates by which the work must be complete.
22. An order to discontinue contravening activity made under Section 18 or an order to do work made under Section 20 may be served personally or by registered mail to the last known address of:
- (a) the owner or occupier of the property where the contravention occurred; and
 - (b) such other persons affected by it as the Officer making the order determines.
- Service by registered mail shall be deemed to have taken place 5 business days after the date of mailing.
23. In addition to service given in accordance with Section 22, an order to discontinue contravening activity made under Section 18 or an order to do work made under Section 20 may be served by an Officer placing a placard containing the order in a conspicuous place on the property where the contravention occurred.
24. Where service cannot be given in accordance with Section 22, sufficient service is deemed to have taken place when given in accordance with Section 23.
25. Every person who contravenes any provision of this By-law is, upon conviction, guilty of an offence and is liable:
- (a) on a first conviction, to a fine of not more than \$10,000; and
 - (b) on any subsequent conviction, to a fine of not more than \$25,000.
26. Despite section 25, where the person convicted is a corporation:

(a) the maximum fine in subsection 25(a) is \$50,000; and

(b) the maximum fine in subsection 25(b) is \$100,000.

27. Where a person has been convicted of an offence, the court in which the conviction has been entered and any court of competent jurisdiction thereafter may, in addition to any other remedy and to any penalty imposed by this By-law, make an order prohibiting the continuation or repetition of the offence by the person convicted.

General Provisions

28. This By-law may be referred to as the Cooling Tower Registry By-law or the Hamilton Cooling Tower Registry By-law.
29. If a court of competent jurisdiction declares any provision or provisions of this By-law invalid, it is the intention of Council that the remainder of the By-law shall continue to be in force.

Enactment

30. This By-law comes into force on the date of its passing.

PASSED this day of , 20 .

R. Bratina
MAYOR

Rose Caterini
CLERK

Cooling Tower Risk Management Plan Template (November 17, 2010)

Components and Format of a Risk Management Plan (RMP)

A RMP should have a number of basic components that would include:

- Site and key contact details.
- Assessment of each of the critical risks.
- Attachments or reference to other documents such as operational manuals and plans, maintenance plans, shut-down procedures, etc.

There is no prescribed format for an RMP - this Template is provided as a guide - other formats can be used as long as they contain all of the information required by this Template.

About the Template

The Template is to be completed by Cooling Tower operators which includes the owner or the person in control of the Cooling Tower(s). Public Health Services staff created this Template based on a review of the current ASHRAE and CTI Guidelines for Legionella control in Cooling Towers, new draft ASHRAE Standards for prevention of Legionella in building systems (Standard 188), and the Risk Management Plan Template developed by the Health Protection Branch of the Victorian State Government, Department of Health, Australia.

Completing this Template or creating your RMP in another format will meet the requirement of having an RMP under the Hamilton Cooling Tower Registry Bylaw. The Bylaw is proposed to come into effect in January 2011.

An RMP must be developed for every Cooling Tower on the site. The RMP, once developed, must be made available to a Public Health Inspector on request.

The Template is also available in Word format at www.hamilton.ca/publichealth under "L" and can be modified to develop your RMP.

Disclaimer

This Template is intended only as a general guide to the development of Risk Management Plans for Cooling Towers. No warranty as to the completeness of the information is given. The City of Hamilton, its Department of Health and its employees disclaim all liability and responsibility for any direct or indirect loss or damage which may be suffered through reliance on any information contained in or omitted from this Template, and no person should act solely on the basis of the information contained in the Template without taking appropriate professional advice about obligations in specific circumstances.

DRAFT

Site and Key Contact Details

Record	Your details
Site location <i>(property address)</i>	
Number of Cooling Towers	
Cooling Tower(s) Registration Number¹	
Cooling Tower(s) location reference <i>(If one exists)</i>	
Property owner's name/contact details <i>(Include corporation name, if applicable, and contact person's business and after-hours telephone numbers)</i>	
Cooling Tower(s) owner's name/contact details <i>(Include corporation name, if applicable, and contact person's business and after-hours telephone numbers)</i>	
Who is responsible for day-to-day operation of the Cooling Tower(s)? <i>(Include corporation name, if applicable, and contact person's business and after-hours telephone numbers). This person must have authority to approve the disinfection of the Cooling Tower(s) on request of the Department of Health. This person is not the water treatment service provider</i>	

¹ This appears on the Certificate of Registration supplied by the Department of Health – CT ID.

Water treatment provider name/contact details
(Include corporation name, if applicable, and contact person's business and after hours telephone numbers)

Critical Risks

1. Stagnant Water

Stagnant Water Risk Control Strategy	Assessment of Cooling Tower(s) <i>(Tick box)</i>	Improvement Response - Indicate the improvements that will be put in place	Proposed Completion Date	Date Completed
Cooling Tower(s) shutdown and start up procedures	Is a Cooling Tower (or part of a Cooling Tower) idle for more than three days? <input type="checkbox"/> Yes - if Yes, answer question immediately below. <input type="checkbox"/> No	Not Applicable	N/A	N/A
	Is there a start up procedure to ensure stagnant water is either drained to waste or treated with a biocide regimen prior to Cooling Tower start up? <input type="checkbox"/> Yes; proceed to next section below. <input type="checkbox"/> No - if No; describe how you will address the risk in the response column; assign a proposed completion date; and date and sign when the improvement is completed.			Date Name Signature

Removal or activation of any 'dead legs'	Are there 'dead legs' in the Cooling Tower(s)? <input type="checkbox"/> Yes - if Yes describe how you will address this risk in the response column; assign a proposed completion date; and date and sign when the improvement is completed. <input type="checkbox"/> No; proceed to next section below.			Date Name Signature
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2. Nutrient Growth

Nutrient Growth Risk Control Strategy	Assessment of the Cooling Tower(s)	Improvement Response - Indicate the improvements that will be put in place	Proposed Completion Date	Date Completed
Identify and manage sources of organic contamination	<p>Are there sources of organic material or debris near the Cooling Tower(s) that could contaminate the Cooling Tower(s) and increase the level of nutrients? Sources of organic material are; dust from nearby construction, road dust, birds, (nesting, faeces, carrion) leaves, etc.</p> <p><input type="checkbox"/> Yes - if Yes, please note the source and type of organic material and describe how this risk will be reduced or managed in the response column. Also; assign a proposed completion date; and date and sign when the improvement is completed.</p> <p><input type="checkbox"/> No; proceed to next section below.</p>			Date Name Signature
Control corrosion	<p>Is a corrosion control program in place?</p> <p><input type="checkbox"/> Yes; proceed to next section below.</p> <p><input type="checkbox"/> No - if No; describe how you will address the risk in the response column; assign a proposed completion date; and date and sign when the improvement is completed.</p>			Date Name Signature

Scaling Control	<p>Is a scaling control program in place?</p> <p><input type="checkbox"/> Yes; proceed to next section below.</p> <p><input type="checkbox"/> No - if No; describe how you will address the risk in the response column; assign a proposed completion date; and date and sign when the improvement is completed.</p>			Date Name Signature
Sediment Control	<p>Is a sediment control program in place?</p> <p><input type="checkbox"/> Yes; proceed to next section below.</p> <p><input type="checkbox"/> No - if No; describe how you will address the risk in the response column; assign a proposed completion date; and date and sign when the improvement is completed.</p>			Date Name Signature
Cleaning and Disinfection	<p>Is/Are the Cooling Tower(s) cleaned and disinfected prior to initial start-up and after any shut down period greater than three days?</p> <p><input type="checkbox"/> Yes; proceed to next section below.</p> <p><input type="checkbox"/> No - if No; describe how you will address the risk in the response column; assign a proposed completion date; and date and sign when the improvement is completed.</p>			Date Name Signature
Protect the basin and 'top deck' of the Cooling Tower(s) from sunlight	<p>Are any of the wetted surfaces exposed to sunlight?</p> <p><input type="checkbox"/> Yes if Yes; describe how you will address the risk in the response column; assign a proposed completion date; and date and sign when the improvement is completed.</p> <p><input type="checkbox"/> No; proceed to next section below.</p>			Date Name Signature

3. Water Quality

Water Quality Risk Control Strategy	Assessment of the Cooling Tower(s)	Improvement Response - Indicate the improvements that will be put in place	Proposed Completion Date	Date Completed
Water treatment program	<p>Are two or more biocides used in a one week rotation?</p> <p><input type="checkbox"/> Yes; proceed to next section below.</p> <p><input type="checkbox"/> No - if No; describe how you will address the risk in the response column; assign a proposed completion date; and date and sign when the improvement is completed.</p>			Date Name Signature
	<p>Is a compatible bio-dispersant used in a water treatment program?</p> <p><input type="checkbox"/> Yes; proceed to next section below.</p> <p><input type="checkbox"/> No - if No; describe how you will address the risk in the response column; assign a proposed completion date; and date and sign when the improvement is completed.</p>			Date Name Signature

	<p>Are control measures in place that measure and confirm that the water chemistry is under control?</p> <p><input type="checkbox"/> Yes; Describe these in the response column</p> <p><input type="checkbox"/> No - if No; describe how you will address the risk in the response column; assign a proposed completion date; and date and sign when the improvement is completed.</p>			Date Name Signature
Testing for HPC	<p>Is the recirculation water tested for HPC?</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p>			Date Name Signature
Testing for <i>Legionella</i>	<p>Is the recirculation water tested for <i>Legionella</i>?</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p>	N/A; testing for <i>Legionella</i> is not a requirement, however, PHS is interested in knowing which Cooling Towers in Hamilton are being tested for <i>Legionella</i> .		
Response to the detection of <i>Legionella</i>	<p>How would you respond to <i>Legionella</i> being detected in a sample?</p> <p><input type="checkbox"/> According to ASHRAE recommendations</p> <p><input type="checkbox"/> According to CTI recommendations</p> <p><input type="checkbox"/> According to Cooling Tower manufacturer instructions</p> <p><input type="checkbox"/> Other response² (describe in response column)</p>			Date Name Signature

² Other response plan must incorporate the minimum recommendations by ASHRAE or CTI.

Labelling of Cooling Tower(s)	<p>Is/Are the Cooling Tower(s) labelled with the Cooling Tower(s) Registration Number (CT ID)?</p> <p><input type="checkbox"/> Yes³; proceed to next section below.</p> <p><input type="checkbox"/> No - if No; describe how you will address the risk in the response column; assign a proposed completion date; and date and sign when the improvement is completed.</p>			Date Name Signature
Automated biocide dosing device	<p>Is an automated biocide dosing device installed?</p> <p><input type="checkbox"/> Yes; proceed to next section below.</p> <p><input type="checkbox"/> No - if No; describe how you will address the risk in the response column; assign a proposed completion date; and date and sign when the improvement is completed.</p>			Date Name Signature
Automated dosing devices for all chemicals or agents	<p>Are automated dosing devices for all chemicals/agents installed?</p> <p><input type="checkbox"/> Yes; proceed to next section below.</p> <p><input type="checkbox"/> No - if No; describe how you will address the risk in the response column; assign a proposed completion date; and date and sign when the improvement is completed.</p>			Date Name Signature

³ The Cooling Tower(s) should be labelled the Registration Number or CT ID, e.g. "1234/1". The number before the front slash designates the site and the number after designates each Cooling Tower on the site.

Appropriate location for chemical dosing	Is the chemical dosing location well away from where the sampling point for bacterial tests? <input type="checkbox"/> Yes; proceed to next section below. <input type="checkbox"/> No - if No; describe how you will address the risk in the response column; assign a proposed completion date; and date and sign when the improvement is completed.			Date Name Signature
Provision of a dedicated water testing location	Is the water chemistry always tested at the same location? <input type="checkbox"/> Yes; proceed to next section below. <input type="checkbox"/> No - if No; describe how you will address the risk in the response column; assign a proposed completion date; and date and sign when the improvement is completed.			Date Name Signature
Labelling of water testing location	Is the water testing location clearly labelled? <input type="checkbox"/> Yes; proceed to next section below. <input type="checkbox"/> No - if No; describe how you will address the risk in the response column; assign a proposed completion date; and date and sign when the improvement is completed.			Date Name Signature

4. Maintenance and Operations

Cooling Tower Maintenance Strategy	Assessment of the Cooling Tower(s)	Improvement Response - Indicate the improvements that will be put in place	Proposed Completion Date	Date Completed
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Review the maintenance program against ASHRAE, CTI, manufacturer's instructions or recommendations	<p>What documents were used as a guide for a maintenance program review?</p> <ul style="list-style-type: none"> <input type="checkbox"/> ASHRAE <input type="checkbox"/> CTI <input type="checkbox"/> Manufacturer's instructions or recommendations <input type="checkbox"/> Other organization's document (describe in response column) <input type="checkbox"/> None;- if None; describe how you will address the risk in the response column 			Date Name Signature
	<p>Has a maintenance review been conducted?</p> <ul style="list-style-type: none"> <input type="checkbox"/> Yes; proceed to next section below. <input type="checkbox"/> No - if No; describe how you will address this in the response column; assign a proposed completion date; and date and sign when the improvement is completed. 			Date Name Signature
	<p>Are there any improvements that can be made to the maintenance program?</p> <ul style="list-style-type: none"> <input type="checkbox"/> Yes - if Yes; describe the improvements in the response column; assign a proposed completion date; and date and sign when the improvement is completed. <input type="checkbox"/> No; proceed to next section below. 			Date Name Signature
Operating and maintenance manuals	<p>Are operating and maintenance manuals developed?</p> <ul style="list-style-type: none"> <input type="checkbox"/> Yes; proceed to next section below. <input type="checkbox"/> No - if No; describe how you will address the risks in the response column; assign a proposed completion date; and date and sign when the improvement is completed. 			Date Name Signature

Age of the Cooling Tower(s)	When was/were the Cooling Tower(s) built?			
Drift eliminator	Are drift eliminators fitted to the Cooling Tower(s)? <input type="checkbox"/> Yes; proceed to next section below. <input type="checkbox"/> No; if No; describe how you will address the risks of excessive drift leaving the Cooling Tower(s) in the response column; assign a proposed completion date; and date and sign when the improvement is completed.			Date Name Signature
	Are the drift eliminators in good condition? <input type="checkbox"/> Yes; proceed to next section below. <input type="checkbox"/> No – if No; describe how you will address the risks of excessive drift leaving the Cooling Tower(s) in the response column; assign a proposed completion date; and date and sign when the improvement is completed.			Date Name Signature

5. Location and Access

Location and Access Risk Control Strategy	Assessment of the Cooling Tower(s)	Improvement Response	Proposed Completion Date	Date Completed
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Risk Management Plan for Cooling Tower(s) Registration Number (CT ID)

13

Understand the extent of potential exposure to the Cooling Tower(s)	<p>Is/Are the Cooling Tower(s) located in a hospital or a long term care facility (nursing home, retirement home, home for the aged)?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If No above, is/are the Cooling Tower(s) located within 500m of a hospital or a long term care facility (nursing home, retirement home, home for the aged)?</p> <p><input type="checkbox"/> Yes; please name the facility(s) within 500 metres in the response column <input type="checkbox"/> No</p>		Not Applicable	Not Applicable
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6. Communication

List names and contact details of who you will inform in the event of a positive <i>Legionella</i> test	Details		
	Category	Name/Title	Telephone
	Staff		
	Occupational Health Staff/Contractors		
	Unions		
	Building Owner		

	Other Building Tenants		
	Corporation Spokesperson		
	Chief Executive		
	Public Health Services	Health Protection Division	905-546-2424 xt 7277
	Other		

7. Endorsement of Risk Management Plan

Name/position of person responsible for Risk Management Plan	
Signature	



Cooling Tower Registration Form

for internal use
only

CT owner Registration No. **prefilled**

Complete this Form to register your Cooling Tower(s) or update an existing Registration.

This Form must be completed by the Cooling Tower(s) owner. The Cooling Tower(s) owner may be an individual, a partnership or a corporation.

Check the appropriate box

☐ Initial registration (Complete this entire Form)

☐ Update (Add new or changed information)

PART A: Cooling Tower Ownership Details

Full Name of Individual or Name of Partnership or Corporation that owns the Cooling Tower(s)

Surname	Given Name	Partnership or Corporation

Full Name of partner completing the Form *on behalf* of a partnership or president/signing officer completing the Form on behalf of a corporation.

Surname	Given Name

Contact Information

Mailing address

Level/Floor	<input type="text"/>	Unit/Suite	<input type="text"/>
Street no.	<input type="text"/>	Street name	<input type="text"/>
Street type (i.e. avenue, road)	<input type="text"/>	Street direction (i.e. West)	<input type="text"/>
City	<input type="text"/>	Postal Code	<input type="text"/>
		PO Box	<input type="text"/>
Other Contact Details			
Phone #	<input type="text"/>	Cell #	<input type="text"/>
Email	<input type="text"/>		
Fax	<input type="text"/>	Pager	<input type="text"/>

May we contact you by email? ☐ Yes ☐ No

IMPORTANT:

A Cooling Tower SYSTEM is:
a single Cooling Tower; or
a series of Cooling Towers that share a water recirculation system or reservoir.

Indicate Number of Cooling
Tower SYSTEMS

Complete **Part B: Cooling Tower SYSTEM Details** for **EACH** Cooling Tower System. This Form is available at www.hamilton.ca/publichealth.

Indicate total number of
individual Cooling Towers
belonging to all Cooling
Tower SYSTEMS

Complete **Part C: Cooling Tower DETAILS** for **EACH** Individual Cooling Tower. This Form is available at www.hamilton.ca/publichealth.

End of Part A

IMPORTANT:

Registration will not be complete unless Part B: Cooling Tower System Details is completed for each Cooling Tower System and Part C: Cooling Tower Details is completed for each Cooling Tower.

I acknowledge as the owner, or as the partner/president/signing officer completing this Form on behalf of the owner, that:

1. the information provided in this Form is accurate and complete;
2. it is the responsibility of the Cooling Tower(s) owner to notify Public Health Services, in writing using this Form, of any change to the information provided in this Form within 10 days of the change;
3. the owner of the Cooling Tower(s) will be Public Health Services' primary contact;
4. it is the responsibility of the Cooling Tower(s) owner to ensure compliance with the City of Hamilton Cooling Tower Registry By-law.

Signature

Date form completed

(yyyy-mm-dd)

Submit completed forms to:

Environmental Health Programs
City of Hamilton Public Health Services
1 Hughson Street North 3rd Floor
Hamilton ON L8R 3L5
Fax: (905) 546-2787

For inquiries contact:

John Fortuna, Public Health Inspector
John.Fortuna@hamilton.ca
(905) 546-2424 Ext. 3038
Website: www.hamilton.ca/publichealth

Personal information required by this Form is collected pursuant to the City of Hamilton Cooling Tower Registry By-law and will be used for Cooling Tower Registry purposes. Questions regarding the collection of this information may be addressed to: Eric Mathews, Manager - Safe Water Program, 1 Hughson Street North 3rd Floor, Hamilton ON L8R 3L5, (905) 546-2424 Ext. 2186

PART B: Cooling Tower System Details

for internal use
only

Site Registration No.
Cooling Tower System ID

Part B must be completed by the Cooling Tower(s) owner as outlined on the Cooling Tower Registration Form.
Complete this Section for EACH Cooling Tower SYSTEM indicated as owned in Part A Cooling Tower Ownership Details.

Name of Cooling Tower System:

Site Details: List the following information for the main building of your facility.

Building Name	<input type="text"/>		
Street no.	<input type="text"/>	Street name	<input type="text"/>
Street type (i.e. avenue, road)	<input type="text"/>	Street direction (i.e. West)	<input type="text"/>
City	<input type="text"/>	Postal Code	<input type="text"/>

Cooling Tower System information:

Purpose of the Cooling Tower(s). Check all appropriate boxes.

Air conditioning	<input type="checkbox"/>	Industrial Process	<input type="checkbox"/>
Refrigeration	<input type="checkbox"/>	Other (Specify)	<input type="text"/>

Nature of the business served by the Cooling Tower(s). Check all appropriate boxes.

Hospital/Health Care	<input type="checkbox"/>	Agriculture	<input type="checkbox"/>	Entertainment	<input type="checkbox"/>
Residential Care	<input type="checkbox"/>	Education	<input type="checkbox"/>	Warehouse	<input type="checkbox"/>
Manufacturing	<input type="checkbox"/>	Office	<input type="checkbox"/>	Retail	<input type="checkbox"/>
Hotel/Accommodation	<input type="checkbox"/>	Dry Cleaning	<input type="checkbox"/>		
Other (specify)	<input type="text"/>				

Number of Cooling Towers in this Cooling Tower SYSTEM

Cooling Tower operator:

Name of the person who is responsible for operation and maintenance.

Title	<input type="text"/>	First name	<input type="text"/>	Surname	<input type="text"/>
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Mailing address and contact information

Level/Floor	<input type="text"/>	Unit/Suite	<input type="text"/>		
Street no.	<input type="text"/>	Street name	<input type="text"/>		
Street type (i.e. avenue, road)	<input type="text"/>	Street direction (i.e. West)	<input type="text"/>		
City	<input type="text"/>	Postal Code	<input type="text"/>	PO Box	<input type="text"/>
Phone #	<input type="text"/>	Cell #	<input type="text"/>		
Email	<input type="text"/>				
Fax	<input type="text"/>	Pager	<input type="text"/>		

May we contact you by email?	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
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Water treatment service provider:

Title	<input type="text"/>	First name	<input type="text"/>	Surname	<input type="text"/>
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Name of Corporation

Physical office location and contact information

Level/Floor Unit/Suite

Street no. Street name

Street type (i.e. avenue, road) Street direction (i.e. West)

City Postal Code PO Box

Phone # Cell #

Email

Fax Pager

May we contact you by email? ☐ Yes ☐ No

Mailing address. If same as physical location, select 'Same as above'

☐ Same as above

Level/Floor Unit/Suite

Street no. Street name

Street type (i.e. avenue, road) Street direction (i.e. West)

City Postal Code PO Box

Complete **Part C: Cooling Tower Details** for **EACH** Cooling Tower. Registration will not be complete unless Part C: Cooling Tower Details is completed for each Cooling Tower. This Form is available at www.hamilton.ca/publichealth.

End of Part B

PART C: Cooling Tower Details

for internal use
only

Site Registration No.
Cooling Tower System ID
Cooling Tower ID

Part C must be completed by the Cooling Tower(s) owner as indicated on the Cooling Tower Registration Form.

Complete this Section for EACH Cooling Tower belonging to the Cooling Tower SYSTEM named below. This is to be done on an annual basis.

Name of Cooling Tower System:

Cooling Tower location: List details for physical location of the Cooling Tower.

Same as the Site Details for the main building or your facility listed in Part B Cooling Tower System Details.

Cooling Tower Name

Level/Floor

Unit/Suite

Street no.

Street name

Street type (i.e. avenue, road)

Street direction (i.e. West)

City

Physical location (i.e. roof)

Cooling Tower information:

Year constructed

GPS co-ordinates (in decimal degrees)

X

Y

Is this Cooling Tower shut down for more than 3 consecutive days?

Yes

No

Is this a seasonally operated cooling tower?

Yes

No

Start Date:

Month

Shut Down Date:

Month

Is a drift eliminator fitted to this system?

Yes

No

Is an automated biocide dosing device fitted to this system?

Yes

No

Estimated system volume

Less than 100 Litres

101 to 1, 000 Litres

1, 001 to 5, 000 Litres

5, 001 to 10, 000 Litres

10, 001 to 50, 000 Litres

More than 50, 000 Litres

Do you have a Risk Management Plan?

Yes

No

When did you last revise your Risk Management Plan?

(yyyy-mm-dd)

Are ASHRAE, CTI or other industry best practices for operating a cooling tower implemented for this cooling tower?

Yes

No

Specify all Best Practice(s) used to prepare your RMP:

ASHRAE	<div></div>	
CTI	<div></div>	
Other	<div></div>	Specify, _____

Are you keeping up-to-date records of maintenance in a log book as per the By-law?	Yes	<div></div>	No	<div></div>
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End of Part C

Stakeholder Consultation Activities regarding proposed City of Hamilton Cooling Tower Registry By-law

Chronology of the stakeholder consultation process regarding the proposed Cooling Tower Registry By-law;

June 9, 2009

Health Protection Division submits Board of Health Report BOH09021.

Recommendation

PHS should consult with stakeholders and report back to Board of Health regarding the development of a proposed City of Hamilton Cooling Tower and Evaporative Condenser Registry By-law.

Accepted

Board of Health directed Hamilton Public Health Services (PHS) to,

“....to consult with stakeholders and report back to the Board of Health with a draft cooling tower and evaporative condenser Registry Bylaw” (BOH09021, pg 1).

August 28, 2009

Ministry of Labour (MOL), Ministry of Health and Long Term Care (MOHLTC) and Ministry of Environment (MOE) informed of the proposed municipal By-law and invited to participate in consultation process.

September 18, 2009

Information packages (explanatory letter and BOH Report) sent to all known local cooling tower operators, owners, and maintenance companies.

November 2, 2009

Information packages mailed to all known local cooling tower operators, owners, and maintenance companies. The package consisted of a: Letter of explanation/invitation to stakeholders, outlining possible user fees associated with registration, a copy of the draft Bylaw, and an evaluation tool/survey designed by MIEH to collate and streamline responses.

MIEH analysis of the responses indicates a survey completion rate of **sixteen (16%) per cent. Consultation highlights include:**

- ❖ **100%** respondents were aware of the potential risk of Legionnaires Disease from cooling towers.
- ❖ **100%** respondents believed that it was important for PHS to decrease the risk of exposure.
- ❖ **80%** supported the establishment of a cooling tower registry.
- ❖ Respondents believed that the creation of the registry would address public health issues by raising and standardizing the local cooling tower operations, documenting low and high risk locations, and developing a database to be used by PHS during outbreaks.
- ❖ Respondents chose PHS as the preferred administrator of the CTS Registry.

November 6, 2009

Consultation package emailed to Ministry of Health and Long Term Care and Ministry of the Environment.

November 6 and 7, 2009

Notice placed in Hamilton Spectator and all other local community papers informing owners and operators of the proposed By Law.

November 6, 2009

Proposed By-law, MIEH survey, and Board of Health report (BOH09021) posted to City of Hamilton Website, specifically Water Safety Program page.

April 26, 2010

PHS submits Board of Health report BOH09021(a) in follow up to BOH09021 (June 2009).

Recommendation

Report BOH09021(a) respecting the Draft Cooling Tower Registry Bylaw, be received.

Board of Health directs Public Health Services to finalize a cooling tower registry By-law in consultation with stakeholders and the public and report back to the Board of Health for its approval and recommendation that Council pass the By-law.

Accepted

Report BOH09021(a) respecting Legionella Cooling Tower Registry By-law, be received. PHS directed to consult with stakeholders, business community and the public and report back to Board of Health for its consideration of a final proposed By Law. PHS is directed to develop a prescribed RMP template and consult with stakeholders.

May 26, 2010

Letter mailed to all local Chamber of Commerce chapters offering an education and learning opportunity for members regarding the proposed By-law.

May 31, 2010

Annual mail-out to cooling tower owners and operators; includes information regarding the proposed By-law and a draft Registration Form.

July 15, 2010

Pinchin Environmental Services conducts an industry seminar regarding the proposed By-law; Legionella Control in Cooling Towers and Evaporative Condensers – The City of Hamilton is proposing a Cooling Tower Registry By-law. How will it affect your facility?

MIEH evaluates the response of attendees as part of the consultation process.

Seventy (70%) response rate from attendees, who included representatives from the following Cooling Tower industry sectors residential, commercial, industrial, and health care.

Highlights include:

- ❖ **93%** of the respondents were aware of the potential risk of Legionnaires Disease from cooling towers.
- ❖ **86%** of the respondents believed the City of Hamilton should develop and operate a CTR.
- ❖ **71%** of the respondents believed Hamilton Public Health Services should be the designated agency chosen to oversee the Registry.
- ❖ **60%** of the respondents believed the registry would have no impact on their current operations.

- ❖ **40%** of the respondents believed the registry would cause them to initiate changes in their current operating procedures.

October 13, 2010

Draft RMP template and an evaluation survey mailed to industry stakeholders with a requested return date of **November 3, 2010**.

November 11, 2010

19 completed RMP evaluation surveys received - 21 % response rate of. MIEH analysis of survey data to be included in the January 2011 Board of Health report.

November 11, 2010

Ministry of Labour, Ministry of Environment, Ministry of Health and Long Term Care informed of Cooling Tower Registry Bylaw progress to date (draft By-law, draft RMP, draft BOH Report).

November 17, 2010...summary of RMP consultation...

December 16, 2010

PHS informs Stakeholders that the consultation phase is complete and shares the final draft of the By-law, Registration Forms, and the RMP Template. PHS informs stakeholders that the Cooling Tower Registry By-law is on the January 24, 2011 Board of Health Agenda, and how to register as a delegate.

December 17, 2010

Notice placed in the Hamilton Spectator and the Hamilton Community newspapers regarding the proposed Bylaw, the consultation process undertaken with stakeholders and the business community, reference to Hamilton PHS website for further information, contact information and the process for becoming a delegate at the January 2011 BOH meeting.